

NEW SPECIES OF *MICROPHTHALMUS*
(POLYCHAETA: HESIONIDAE) FROM
THE PACIFIC NORTHWEST

Judith A. Fournier

ABSTRACT

Three species of *Microphthalmus* are described from British Columbia and Washington. *M. hystrix* n. sp. is unique in bearing 4–5 hooked spines in the notopodia of almost all setigerous segments. *M. coustalini* n. sp. resembles *M. riojai* Reish, 1968 from Baja California in size, segment count, and in having relatively short antennae and tentacular, dorsal and anal cirri but differs in having a median antenna, much larger pectinate comb setae, and variable compound setae with long blades more than six times the length of the shorter ones. A third species belonging to the *Microphthalmus szcelkowi-southerni*-group as defined by Westheide (1977) is described but not named. It is represented by only three specimens from two locations. It is characterized by notopodia with only a single acicula and comb seta, the latter with only about five teeth, and neuropodia with five to six compound setae with longer, bifid blades about four times longer than the shorter, unidentate blades, all blades appearing smooth under high power light microscopy (1500 \times).

The interstitial polychaetes of the North-western Pacific coast have been poorly studied. No species belonging to the genus *Microphthalmus* Meczniow has been hitherto reported from the Puget Sound-British Columbia region. Three species have been discovered in material collected from widely separated areas. Two of these have distinctive features that allow them to be separated readily from the 25 species and 4 subspecies of *Microphthalmus* currently known to science. The third species belongs to the *M. szcelkowi-southerni*-group (Westheide, 1977) but is represented by too few specimens of too diverse character to determine its relationship to other members of this group.

SYSTEMATICS

Family Hesionidae
Subfamily Microphthalminae Hartmann-Schröder
Genus *Microphthalmus* Meczniow

Type Species.—*M. szcelkowi* Meczniow, 1865.

Diagnosis.—Usually small hesionids with three antennae, two eyes, palps simple, six pairs of tentacular cirri on separate segments. Eversible pharynx with distal circlet of papillae, jaws absent. Median antenna attached posteriorly. Parapodia sub-biramous; notopodia usually bearing one curved pectinate comb seta, other setae may be present or absent; neurosetae usually compound. Pygidium bearing a broad, flattened anal lobe with two cirri.

Microphthalmus hystrix new species
Figure 1a–d

Type Locality.—Washington State, Puget Sound, Bush Point, South Whidbey Island, 48°02'N, 122°36'W, collected August 20, 1980 by Jeannette Barreca. Cobble beach with abundant algae (unidentified), –2.5 m from MHW.

Type Material.—Four specimens from type locality have been deposited in the collection of the Canadian Museum of Nature, Ottawa. The holotype, NMCA1989-0276, is about 2.5 mm long, 0.2

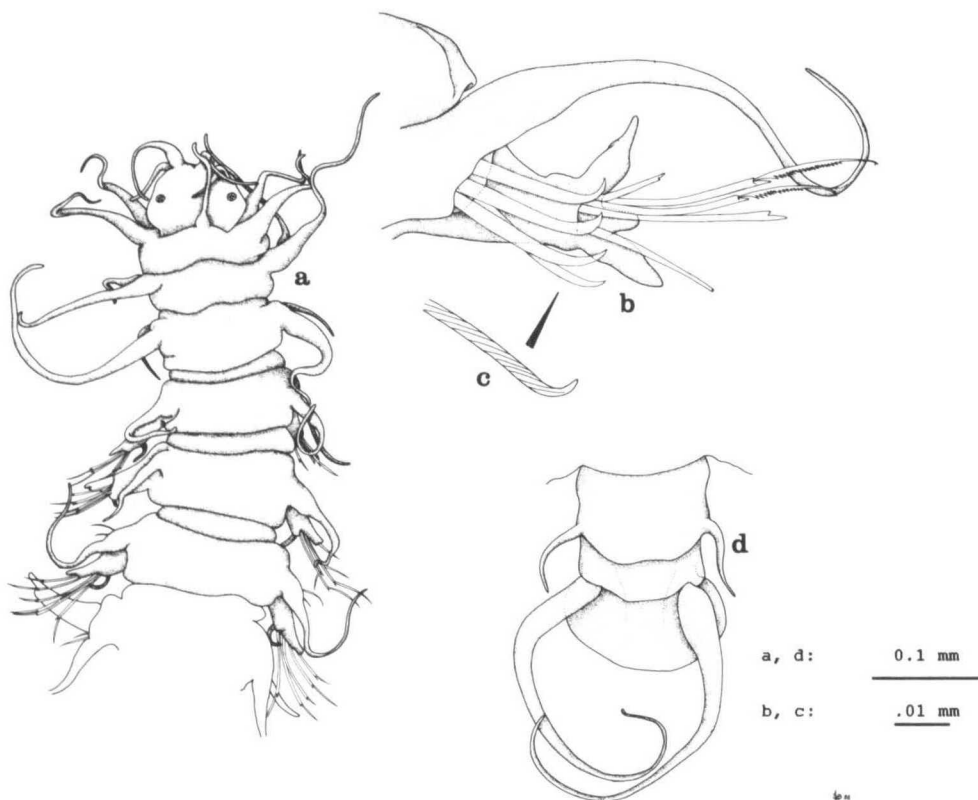


Figure 1. *Microphthalmus hystrix* n. sp. (a) Anterior end, dorsal view; (b) dorsal view of parapodium showing notopodial hooks and neuropodial compound setae; (c) dorsal view of pygidium.

mm wide excluding setae, and 50 setigers long. The three paratypes, NMCA1989-0277, two complete and one anterior fragment, are similar in size and shape but not quite as well preserved, having suffered damage to the head and some parapodia. The largest specimen comprises 52 setigers.

Etymology.—The species name is from the Greek word for porcupine, referring to the unique large acicular hooks found in this species.

Description.—Body colorless, slender, very fragile. Head rounded, three antennae, median antenna longer than prostomium and inserted at the extreme posterior margin. Two eyes present, palps simple, elongate, similar to antennae (Fig. 1a). Six pairs of tentacular cirri on three distinct segments. Length of dorsal cirri about twice body width, ventral cirri shorter. Setigerous segments biannulate, first setiger with reduced notopodia. Remaining notopodia with one to five large, hooked spines (Fig. 1b, c) in addition to a knobbed acicula and a ventral curved comb seta, not always visible dorsally. Notopodial hooks first appear singly in setiger 2, increase in number to four to five by setiger 5, and continue to end of body. Neuropodia with upper and lower simple setae, five fimbriated compound setae with long blades, and a stout, knobbed acicula. Longer compound blades 2–2.5 times length of shorter ones. Pygidium with 1–3 preanal asetigers with dorsal cirri, anal plate smooth, anal cirri elongate (Fig. 1d).

Two of the specimens appear to be ovigerous but due to the paucity of specimens in the type series, no sections have been made to search for spermatophores. Additional uncatalogued material belonging to this species has been found in the

polychaete collection of the Los Angeles County Natural History Museum. One large ovigerous specimen with 70 setigers has a fimbriated anal plate. It appears that whether or not the anal plate is fimbriated is not a good character for separating species of *Microphthalmus*. This material will be subject to further study.

Differential Diagnosis.—The 4–5 stout, curved, notopodial hooks in each setiger serve to distinguish *M. hystrix* from all other members of the genus. *M. ancistrosylliformis* Hartman-Schröder, 1962b from Chile, and possibly *M. aciculata* Hartmann-Schröder, 1962a from Peru have single, weakly S-shaped notopodial needle setae but do not have such strongly hooked setae as are found in this species.

Discussion.—Westheide (1977) divides *Microphthalmus* into several groups based on a hierarchy of pleisomorphic/apomorphic characters. Based on his analysis, *M. hystrix* has an abundance of pleisomorphic characters, particularly its large number of undifferentiated segments, long filiform antennae and cirri and a variety of types of neurosetae. More study is needed to determine the exact relationship among the groups of closely related species of this genus.

Microphthalmus coustalini new species

Figure 2a–i

Type Locality.—Porpoise Harbour, off Port Edward, British Columbia, stations B1 (54°14.57'N, 130°18.58'W, 15 m), B6 (54°14.17'N, 130°18.30'W, 15 m), B9 (54°13.66'N, 130°17.80'W, 18.2 m) and B10 (54°13.19'N, 130°17.60'W, 22 m); collected by Dr. Martin Pomeroy, Environment Canada, West Vancouver Branch, April 21, 1983.

Type Material.—Holotype (NMCA1989-0278) and 6 paratypes (NMCA1989-0279, 1 specimen; NMCA1989-0280, 3 specimens; NMCA1989-0281, 1 specimen; and NMCA1989-0282, 1 specimen) have been deposited in the collection of the Canadian Museum of Nature, Canada.

Etymology.—This species is named after my colleague, Jean Coustalin, Environment Canada, West Vancouver, B.C. who first found it and sent it to me for identification.

Description.—Body (Fig. 2a) yellowish-brown, pigment persisting in alcohol; 29–31 setigers, maximum 4.2 mm long, 0.24 mm wide, leathery texture. Prostomium (Fig. 2b) semi-circular, two eyes dorsally on posterior margin, frontal antennae and palps shorter than length of prostomium. Median antenna inserted between eyes, very short and slender, easily overlooked. Three pairs of tentacular cirri on following three segments. Dorsal cirri longer than ventral, length less than width of segments. Notopodia with dorsal cirri shorter than neuropodial lobe, simple needle seta (Fig. 2g) and one to two pectinate comb setae (Fig. 2e) present in addition to knobbed acicula (Fig. 2f). Comb setae stout and elongate with about 20 teeth and elongated tip. Neuropodial acicula knobbed. Neurosetae five to nine heterogomph compound spinigers and falcigers (Fig. 2h, i), longest blades more than six times length of shortest, strongly toothed, bifid, bare distal region below terminal teeth, no simple setae. Pygidium (Fig. 2d) with 1 pre-anal setiger; anal plate small, smooth; two anal cirri shorter than plate.

Differential Diagnosis.—This species is closest to *Microphthalmus riojai* Reish, 1968 from Bahia de Los Angeles, Baja California. It is similar in size, number of setigers and in having dorsal cirri shorter than the neuropodial lobe. *M. coustalini* differs from that species in possessing a median antenna (albeit significantly reduced), stout, elongate comb seta with about 20 teeth (as opposed to 8 in *M. riojai*), and the much longer blades on the compound neurosetae. The present

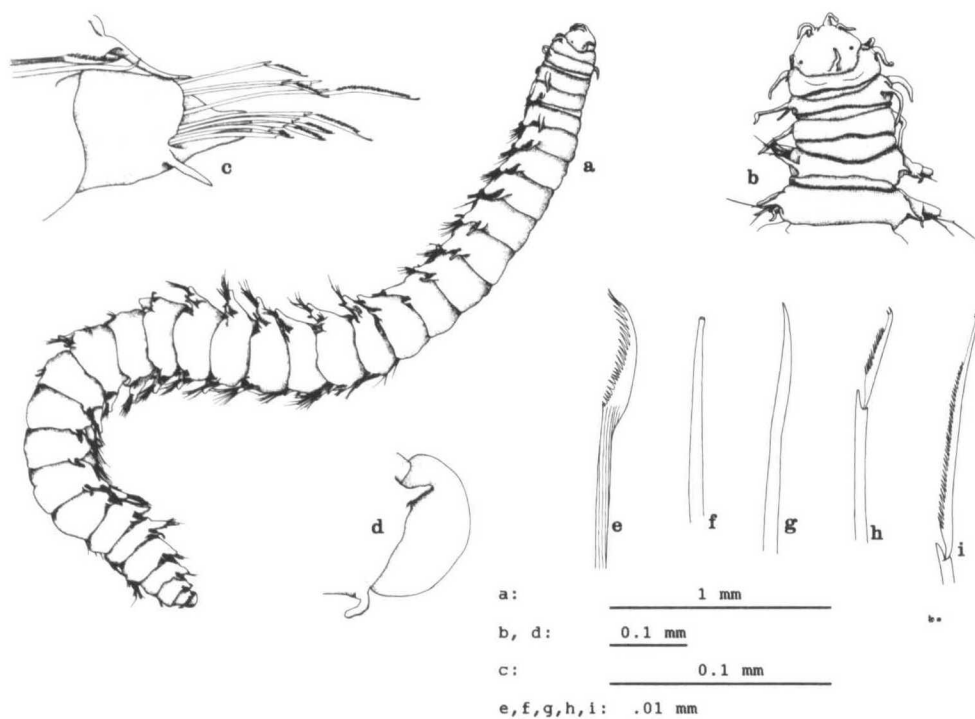


Figure 2. *Microphthalmus coustalini* n. sp. (a) Entire animal, dorso-lateral view; (b) parapodium; (c) anterior region, dorsal view; (d) pygidium, dorsal view with anal cirri; (e) notopodial comb seta; (f) notopodial acicula; (g) notopodial needle seta; (h, i) neuropodial compound setae.

species also lacks the peculiar knob-shaped dorsal and ventral cirri on the preanal asetiger of *M. riojai* and has shorter anal cirri.

It can be distinguished from all other described species of *Microphthalmus* by its relatively short antennae, tentacular cirri and dorsal cirri and details of the structure of the comb setae, the compound neurosetae, and the pygidium.

Microphthalmus species A

Figure 3a-d

Localities.—British Columbia, Vancouver Island, Alberni Inlet, approximately 49°05'N, 124°50'W; 30 m, collected by Ketcham, September 1974; Banks Island, British Columbia; east of English Rock, 53°35'N, 130°34.3'W, 7 m, collected by Katherine D. Hobson, July 19, 1974.

Material examined.—Three specimens in the collection of the Royal British Columbia Museum, Victoria, B.C., catalogue numbers RBCM975-193-3 (2 specimens); RBCM974-274-25 (1 ovigerous female).

Description.—One specimen, 1.9 mm long, 0.17 mm wide for 20 setigers, contains a pair of ova in each of setigers 8–12. The other two specimens have 27 and 31 setigers, to 3.2 mm long and 0.2 mm wide, non-ovigerous; bodies transparent and very fragile.

Prostomium rounded with two eye spots, three antennae and two palps elongate. Median antenna well developed in ovigerous specimens, longer than prostomium; other specimens are damaged. Six pairs of tentacular cirri on following three segments, up to width of segment in length.

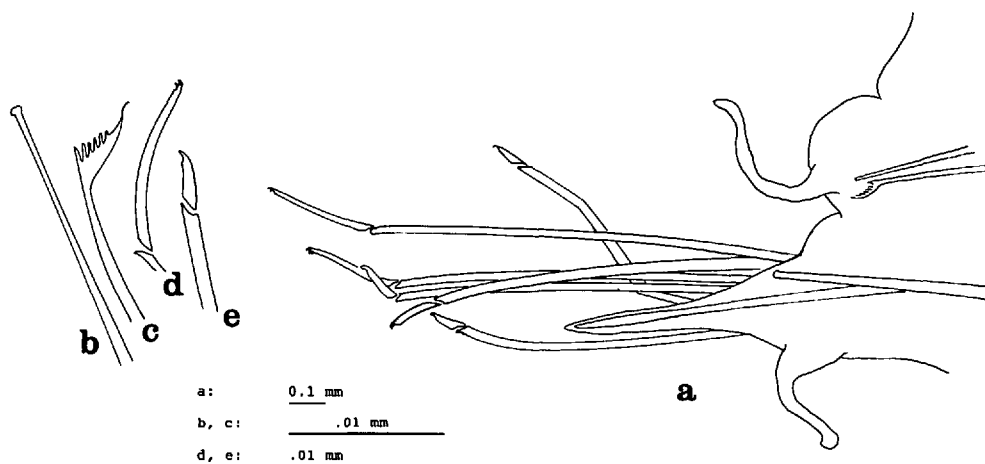


Figure 3. *Microphthalmus* sp. A. (a) Parapodium showing relative sizes of noto- and neurosetae and terminal neuropodial ligule bearing accessory acicula; (b) notopodial acicula; (c) notopodial comb setae; (d, e) neuropodial compound setae.

Notopodia (Fig. 3a) reduced; only one acicula and one to two comb setae (Fig. 3b, c) present, very small and do not project from body; comb setae with about five teeth. Neuropodia conical with terminal ligule bearing embedded acicular seta ("lamellenförmige Zunge" Westheide 1967) and 5–9 compound setae (Fig. 3d, e), longer blades bidentate, about four times length of shorter, unidentate blades. These setae appear completely smooth at higher magnification (1500 \times , phase contrast). Pygidium rounded, smooth, one pre-anal asetiger; bears 2 anal cirri slightly longer than the anal plate.

Differential Diagnosis. — This species is very similar to *Microphthalmus szcelkowi* Meczniow, 1865 from the North Sea as described by Westheide (1967) and differs primarily in the finer structure of the notopodial comb setae (only five teeth as opposed to ten), and the apparent smoothness of the blades of the compound setae. It closely resembles *M. southerni* Westheide, 1967 from the Irish coast in the form of the comb setae (five teeth in both species) and the weak (if any) dentition of the compound bladed setae, but differs in having neuropodia that end in an acicular ligule, in having fewer setigers (a maximum of 31 rather than 40), and smaller size (3.2 mm rather than 6 mm). However, two of the present specimens are damaged and the third, which appears to be gravid, is much shorter than the others. More material is needed to determine the taxonomic status of these specimens.

ACKNOWLEDGMENTS

Ms. S. Laurie-Bourque prepared the excellent drawings in Figures 1 and 2. I am grateful to my colleagues, J. Barreca, formerly of the University of British Columbia, Vancouver, B.C. and J. Coustalin and M. Pomeroy of Environment Canada, West Vancouver Branch, B.C. and P. Lambert, Royal British Columbia Museum for sending me their specimens. The manuscript has benefited from constructive criticism by my colleague Dr. G. Gibson and two anonymous reviewers.

LITERATURE CITED

Hartmann-Schröder, G. 1962a. Zweiter Beitrag zur Polychaetenfauna von Peru. Kieler Meeresforschungen. 18: 109–147, pl. 1–20.

- . 1962b. Teil II. Die Polychaeten des Eulitorals. Pages 57–167 in G. Hartmann-Schröder and G. Hartmann, eds. Zur Kenntnis des Eulitorals der chilenischen Pazifikküste und der argentinischen Küste Südpatoriens unter besonderer Berücksichtigung der Polychaeten und Ostracoden. Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut, Ergänzungband zu Band 60: 1–270.
- Reish, D. J. 1968. A biological survey of Bahia de Los Angeles, Gulf of California, Mexico. II. Benthic polychaetous annelids. Trans. San Diego Soc. Nat. Hist. 15(7): 67–106.
- Westheide, W. 1967. Monographie der Gattungen *Hesionides* Friedrich und *Microphthalmus* Mecz-
nikow (Polychaeta, Hesionidae). Zeitschrift für Morphologie der Tiere 61(1): 1–159.
- . 1977. Phylogenetic systematics of the genus *Microphthalmus* (Hesionidae) together with a description of *M. hartmanae* nov. sp. Pages 103–113 in D. J. Reish and K. Fauchald, eds. Essays on polychaetous annelids in memory of Dr. Olga Hartman. Allan Hancock Foundation, Los Angeles.

DATE ACCEPTED: March 14, 1990.

ADDRESS: Zoology Division, Canadian Museum of Nature (formerly the National Museum of Natural Sciences), C.P./P.O. Box 3443, Station 'D', Ottawa, Ontario, K1P 6P4 Canada.